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Speaking clearly ... 10 years on: The case for an integrative perspective of self-talk in sport

Alexander T. Latinjak¹², Antonis Hatzigeorgiadis³, Nikos Comoutos³ & James Hardy⁴

¹ University of Suffolk, UK

² EUSES, University of Girona, Spain

³ University of Thessaly, Greece

⁴ IPEP, Bangor University, Wales, UK

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Running head: AN INTEGRATIVE PERSPECTIVE OF SELF-TALK

Author Note

Alexander T. Latinjak, School for Psychology and Education, University of Suffolk.
Waterfront Building, 19 Neptune Quay, IP4 1QJ Ipswich, UK. E-mail: a.latinjak@uos.ac.uk.
Phone: 0044 7979343965

Antonis Hatzigeorgiadis, Department of Physical Education and Sport Science,
University of Thessaly, Karies, 42100 Trikala, Greece. E-mail: ahatzi@pe.uth.gr. Phone:
0030 6974009004

Nikos Comoutos, Department of Physical Education and Sport Science, University of
Thessaly, Karies, 42100 Trikala, Greece. E-mail: nzourba@pe.uth.gr. Phone: 0030
6947695094

James Hardy, Institute for the Psychology of Elite Performance (IPEP), School of
Sport Health & Exercise Sciences, Bangor University, Bangor, LL57 2PZ, United Kingdom.
Email: j.t.hardy@bangor.ac.uk. Phone: 0044 1248 38 3493

Abstract

Over a decade ago, Hardy (2006) published his literature review that contained a working definition that has shaped subsequent studies about self-talk, contributing to the noticeable expansion of this research area. The rapid development of the self-talk literature in sport since then has bred the need to rethink how self-talk is conceptualized. The purpose of the present article was twofold: (a) to review how conceptualizations of self-talk and the associated research perspectives have changed during the past decade and (b) to introduce a new integrative conceptualization of sport self-talk. We identify two main developments that alter our view of what self-talk is, reinforcing the need for a new conceptualization: The identification of two distinct self-talk entities (organic self-talk and strategic self-talk); and the distinctions between spontaneous and goal-directed self-talk, as these emerged within organic self-talk. Consequently, we propose a new integrative conceptualization of self-talk. We believe that for such a conceptualization to be sufficient so as to guide future research, several attributes of self-talk ought to be recognized: the necessary and sufficient attributes that define self-talk, and important descriptive attributes, including overttness, interpretation, origins, and functions, which facilitate the understanding and the study of the self-talk phenomena.

Keywords: athletes, cognitive processes, conceptualization, private speech, thoughts

Speaking clearly ... 10 years on: The case for an integrative perspective of self-talk in sport

The beginnings of the systematic research of self-talk in sport can be traced between the eighties and nineties of the twentieth century (e.g., Van Raalte, Brewer, Rivera, & Petitpas, 1994; Weinberg, Smith, Jackson, & Gould, 1984). As with most fledgling topics in a field, research on self-talk had to face several challenges, due, among other reasons, to the vague definitions and a lack of theory behind self-talk research (Hardy, Jones, & Gould, 1996). As the number of publications on self-talk increased, several definitions, including aspects of conceptualizations, of self-talk were proposed (for an overview please refer to Table S1 offered as an online supplement). Hardy (2006) reviewed those definitions and categorized them into three groups; behavioural-oriented, cognitive-oriented, and effect-oriented. After critically reviewing the previously employed definitions, Hardy proposed a new working definition of self-talk. Based on his review, “self-talk should be defined as: (a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements associated with the content of statements employed; (d) being somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete” (p. 84).

Up to the present date, Hardy’s (2006) article has been cited in more than 359 contributions according to Google Scholar (December 2018), many of which have referred to his definition of self-talk. Nonetheless, Hardy noted that considering the dynamic nature of socially constructed variables, among which is self-talk, the definition will require modification to accommodate empirical and conceptual advances. Over a decade has passed since Hardy’s working definition was published and the research area of self-talk has expanded rapidly exemplified by the relatively recent special edition of *The Sport Psychologist* focused on self-talk. Expectedly, our way of looking at self-talk has been

1 challenged and the self-talk literature has outgrown previously employed conceptualizations;
2 accordingly, some researchers believe it timely to reconsider the conceptualizations of self-
3 talk (e.g., Latinjak, Zourbanos, López-Ros, & Hatzigeorgiadis, 2014; Van Raalte, Vincent, &
4 Brewer, 2016).

5 Two major developments within the self-talk literature in sport create the need to
6 rethink the conceptualization and the classification of self-talk. The first development was the
7 identification of two distinct self-talk entities that were initially reflected in two different
8 research perspectives (Theodorakis, Hatzigeorgiadis, & Zourbanos, 2012). The first entity,
9 what in our review we introduce as *organic self-talk*, previously also referred to as *automatic*
10 (Zourbanos, Hatzigeorgiadis, Chroni, Theodorakis, & Papaianou, 2009), reflects self-talk as
11 inherent thoughts and self-statements athletes address to themselves. Self-talk, in this case,
12 either represents psychological processes or stems from metacognitive knowledge and skills.
13 The second entity has been termed *strategic self-talk* (Theodorakis et al., 2012) and reflects
14 self-talk as a deliberately employed strategy, mostly developed through interventions,
15 involving the use of cue words or phrases to enhance performance or achieve other related
16 outcomes (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011; Hatzigeorgiadis,
17 Zourbanos, Latinjak, & Theodorakis, 2014). In this case, self-talk originates through
18 adherence to strategic plans and is based on memory. The two research entities are reflected
19 in two important research strands of in sport psychology; understanding the psychology in
20 sport and using psychology to improve sport experiences, respectively.

21 The second development revolved around the distinctions between spontaneous and
22 goal-directed self-talk, as these emerged within the organic self-talk perspective (Latinjak et
23 al., 2014). With these developments in mind, the purpose of the present article was (a) to
24 review the multiple conceptualizations and classifications of self-talk currently in the sport-
25 psychology literature and how these have changed during the past decade, and (b) to present a

1 new conceptualization of self-talk. In doing so, we anticipated that we would raise awareness
2 and a more thorough appreciation of alternative conceptualizations of self-talk that, in turn,
3 would stimulate new research questions, ultimately further developing the topic and enriching
4 understanding. To these ends, as we reviewed aspects of the contemporary self-talk literature,
5 we highlighted issues apt for investigation.

6 **Conceptualizations and classifications of self-talk**

7 In relatively recent years, four reviews of the self-talk in sport literature have been
8 published in peer-reviewed journals. The first two focused on the effectiveness of self-talk
9 interventions, examining the effects of strategic self-talk on sport-task performance, through
10 a meta-analysis (Hatzigeorgiadis et al., 2011) and a systematic review (Tod, Hardy, & Oliver,
11 2011). The third focused on organic self-talk and introduced the dual-processing perspective
12 (Van Raalte et al., 2016). Lastly, the fourth review provided a historical look back at the
13 empirical literature highlighting landmark self-talk studies (Hardy, Comoutos, &
14 Hatzigeorgiadis, 2018). Uniquely, the present review attempted to address the central issue of
15 what constitutes self-talk in an integrative way. Therefore, its purpose was to highlight the
16 major advances regarding the conceptualizations and classifications of self-talk. Some of
17 these advances lead us to the point where previous conceptualizations of the construct are
18 now insufficient to encapsulate all current lines of research, thus having limited value to
19 guide future investigation on self-talk. Our review focuses on the development of the
20 conceptualizations and taxonomies of self-talk within the sport literature. Initially,
21 considering the two entities of self-talk, we acknowledge the main research perspectives that
22 have emerged over time, including studies on organic self-talk reported by athletes during
23 their sport participation, and strategic self-talk through interventions inducing the use of self-
24 talk plans during task performance. Regarding organic self-talk, we reviewed data-driven and
25 theory-driven conceptualizations of self-talk based on the content and/or functions of self-

1 talk. Concerning strategic self-talk, we identified the major objectives of interventions
2 evident in sport self-talk literature.

3 **Organic self-talk**

4 By the term *organic self-talk* we refer to inherent thoughts and self-statements athletes
5 address to themselves. Other terms that have been applied in sport psychology to this type of
6 self-talk were *automatic* (Zourbanos et al., 2009) or *spontaneous* (Van Raalte, Cornelius,
7 Copeskey, & Brewer, 2014) self-talk. We prefer the term *organic* because it can be defined as
8 characteristic of, pertaining to, or derived from living organisms. Further, both *automatic* and
9 *spontaneous* could lead to misunderstandings because these terms were used in general
10 psychology in relation to uncontrolled cognitive processes; see for example, Christoff's
11 (2012) definition of spontaneous thinking. Hence, we opt for *organic* because both
12 uncontrolled (i.e., thought that appear automatically or spontaneously) and controlled (i.e.,
13 self-statements deliberately used by the athlete to self-regulate) self-addressed statements are
14 used by athletes in relation to their sport participation. In their attempt to understand the
15 content and the structure of organic self-talk, researchers have employed two approaches,
16 which are outlined below: data-driven and theory-driven approaches.

17 **Data-driven approaches.** In the sport literature, the traditional view of self-talk that
18 has emerged from inductive qualitative analyses has drawn the distinction between two
19 strands focussing on (a) the content of self-talk, and more specifically its valence, that is,
20 positive, neutral and negative self-statements; and (b) the function of self-talk, originally
21 identified as motivational and instructional self-talk (Hardy, Gammage, & Hall, 2001).
22 According to the content perspective, positive self-talk ("Good job, do it again") refers to
23 encouragement or talk that one could be successful; negative self-talk ("Stupid mistake") is
24 self-critical or represents an inability to succeed; whereas neutral self-talk ("I have to keep
25 my knees bent") reflects statements that are neither positive nor negative in valence.

1 Inductive analyses of athletes' self-statements have also revealed other content-based self-
2 talk taxonomies.

3 With regard to some of these alternative content-based aspects, some consideration of
4 the grammatical structure of self-talk has occurred with the most recurrent theme recognizing
5 I-statements ("I can do it") and you-statements ("You can do it"; Hardy et al., 2001; Latinjak,
6 et al., 2014). Indeed, second person self-statements have received special attention in the
7 social psychology literature, where it has also been investigated under the label of *fragmented*
8 *self-talk* (Zell, Warriner, & Albarracin, 2012). Furthermore, regarding the overtness of
9 verbalizations, authors in sport psychology have distinguished overt from covert self-talk
10 (Hardy, Hall, & Hardy, 2005). Covert self-talk is articulated sub-vocally, as a voice inside the
11 athletes' mind, whereas overt self-talk is articulated audibly so that others may hear what is
12 said. In psychology, the overtness of self-talk was relevant to the distinction between private
13 speech (i.e., addressed to oneself), and inner speech (i.e., private and covertly; Winsler,
14 2009). Accordingly, it is the shift towards covertness that reflects the gradual internalization
15 of private speech to form inner speech (Vygotsky, 1962).

16 When considering the functions of organic self-talk, that is, the purposes self-talk is
17 intended to serve, two main functions have been identified: instructional, referring to
18 statements that aid performance by triggering desired actions through proper focus of
19 attention, correct technique, and strategy execution (Hardy et al., 1996); and motivational,
20 referring to self-talk that increases performance by enhancing confidence, inspiring greater
21 effort, and creating positive mood (Theodorakis, Weinberg, Natsis, Douma, & Kazakas,
22 2000). Hardy et al. (2001) further refined these functions, distinguishing instructional self-
23 talk functions into skills-related and strategy-related (e.g., to improve my skills, to execute
24 plays, respectively), and motivational self-talk functions into arousal, mastery and drive (e.g.,
25 to calm nerves, to feel prepared, to keep going, respectively). It is worth noting that the terms

instructional and motivational have been used less in association with organic self-talk than for identifying different self-talk interventions (Theodorakis et al., 2000). Nonetheless, it should be kept in mind that reports of motivational and instructional organic self-talk reflect the *perceived* functions of athletes' self-talk, whereas, in interventions, motivational and instructional cue-words are vocalized mechanically before, during, and/or after task execution. Because the conceptualization of motivational and instructional self-talk was presented before the recognition of this distinction, they have been applied to organic self-talk and strategic self-talk alike. Yet, there is a subtle difference between them across these perspectives, related to the self-talk entities around which they evolved; whereas within organic self-talk, self-talk *inherently possesses* specific motivational and instructional purposes, in self-talk interventions, cue words are *designed and applied to serve* specific motivational and instructional purposes.

Although presented here as separate features of self-talk, data-driven investigations have sometimes blurred the lines between content and functions. In the earlier years of self-talk research, positive self-talk was defined as self-talk that helps the athlete keep his/her focus of attention in the present, not on past errors or the distant future (Weinberg, 1988). Negative self-talk was described as self-talk that gets in the way because it is inappropriate, irrational, counterproductive or anxiety-producing (Theodorakis et al., 2000). Subsequently, Hardy et al. (2001) recognized the potential ambiguity between the content and the functions of self-talk that characterized such definitions and proposed to distinguish between positive and negative self-talk based on the content of statements, rather than their effect.

More recently, our knowledge of organic self-talk has been advanced by the development of different self-talk scales in sports (e.g., Functions of Self-Talk Questionnaire; Theodorakis, Hatzigeorgiadis, & Chroni, 2008) and general psychology (e.g., Self-Talk Scale; Brinthaupt, Hein, & Kramer, 2009). Zourbanos et al.'s (2009) investigation is an

example of one such development in sports. These authors developed the Automatic Self-Talk Questionnaire for Sport (ASTQS), an inclusive measure of athletes' self-talk, describing four types of positive self-talk including psych-up, confidence, instruction, and anxiety control, three types of negative self-talk, described as worries, disengagement, and somatic fatigue, and irrelevant self-talk. As is apparent, the types of positive self-talk were identified based on the content, as well as describing functions, whereas the negative types of self-talk are reflective of content alone. One way in which to remedy this discrepancy is by consideration of theory-driven approaches of self-talk, which place an emphasis on organic self-talk reflecting athletes' uncontrolled thoughts and controlled self-statements that athletes use autonomously to self-regulate within their sport.

Theory-driven approaches. A series of theoretical frameworks have had an impact on the taxonomies employed to investigate organic self-talk. Of note is the introduction of theories and models from general psychology that have brought fresh ideas to this area (e.g., Conroy & Metzler, 2004; Latinjak et al., 2014; Oliver, Markland, Hardy, & Petherick, 2008; Van Raalte et al., 2016).

The introduction of thought-processing theories is of particular relevance concerning the overlaps between the content and functions of data-driven approaches of athletes' organic self-talk. Researchers in psychology and the sport sciences have repeatedly distinguished (a) processes related to cognitive control, such as conscious, operant, reflexive or goal-directed thinking, from (b) more automatic and uncontrolled processes, such as unconscious, respondent or spontaneous thinking (Christoff, 2012; Klinger, 1977). Controlled processes typically involve effort, intention, and awareness, tend to interfere with one another, and are usually experienced as self-generated thoughts; whereas automatic processes lack effort, intention, or awareness, tend not to interfere with one another, and are usually experienced as perceptions or feelings (Lieberman, 2003).

Of relevance to sport self-talk, Van Raalte et al. (2016) adapted Kahneman's (2011) dual-processing theory to explain the phenomenon of self-talk in sport. They identified (a) an intuitive type of self-talk (also called, System I self-talk) that comes to mind spontaneously, focuses awareness on current experiences, and represents the immediate, emotionally charged reaction to a situation ("Damn it, I messed up"); and (b) a rational type of self-talk ("Calm down, it was not entirely your fault") based on reason, which is emotionally neutral (also called, System II self-talk). Similarly, Latinjak et al. (2014) applied a distinction employed in neuropsychology studies focusing on differing thought processes and their associated brain regions (Christoff, 2013). This body of neuropsychological research differentiates between goal-directed (controlled) and undirected (uncontrolled) thought processes. When introducing distinctions made in the thought-based literature to sport-oriented self-talk, Latinjak and colleagues (Latinjak, 2018; Latinjak et al., 2014; Latinjak, Hatzigeorgiadis, & Zourbanos, 2017) adapted and modified Christoff's (2012) original framework, to describe the goal-directed and spontaneous self-talk captured from athletes. In line with Christoff, Gordon and Smith (2011), goal-directed self-talk usually occurs during reasoning, problem solving, and decision making and can be described as an expressive of a controlled mental process deliberately employed towards solving a problem or making progress on a task. Further, goal-directed self-talk includes the representation of current and desired states and develops coordinated actions which attempt to convert the former to the latter (Unterrainer & Owen, 2006). Conversely, spontaneous self-talk consists of unintended, non-instrumental statements that come to mind unbidden and effortlessly, which are, however, linked to the task or activity at hand and relevant contextual stimuli.

Closer consideration of the structure of intuitive/spontaneous and rational/goal-directed self-talk reveals specific subtypes, based on the statements content and functions, respectively. For instance, Latinjak, Corbalan-Frigola, Alcoy-Fabregas and Barker (*in press*)

1 studied the content of *spontaneous self-talk* in emotion-eliciting situations and described
2 mainly positive, neutral and negative anticipatory self-talk and positive and negative
3 retrospective self-talk. They also concluded that spontaneous self-talk can be viewed as a
4 window into the athlete's mind. Spontaneous self-talk informs on athletes' performance
5 beliefs ("I can score"), goal-orientations ("I don't want to lose"), irrational beliefs ("I have to
6 win"), thoughts of disengagement ("I want to stop"), and attributions of success ("I am the
7 best") and failure ("He didn't pass the ball"). With regard to controlled processes, Van
8 Raalte, Morrey, Cornelius and Brewer (2015), analyzed the functions of marathon runners'
9 rational self-talk during competitions. They reported that both elite and non-elite runners
10 indicated most frequently the use of associative ("My breathing is controlled"), positive-
11 motivational ("You can do it!"), and incentive self-talk ("I will feel much better after
12 finishing"). Similarly, Latinjak, Masó and Comoutos (2018) examined goal-directed self-talk
13 during the acquisition of technical skills in frisbee and revealed a large variety of self-talk
14 functions. For an example of the specificity of goal-directed self-talk functions, consider that,
15 before task execution, athletes provided themselves with technical instructions ("extend your
16 arm"). However, between task executions, instructions were frequently transformed into both
17 error descriptions ("you've bent your arm") and technical adjustment following errors
18 ("extend your arm further"), or into technical transference following success ("keep
19 extending your arm"). Importantly, Latinjak (2018) provided preliminary evidence regarding
20 the dynamic interplay within the different types of organic self-talk. The results of this study
21 showed a strong sequential link from spontaneous to goal-directed self-talk, strengthening the
22 suggestion that intuitive thought processes, including spontaneous thinking, occur temporally
23 before rational processes, which include goal-directed thinking (Kahneman, 2011; Van Raalte
24 et al., 2016). Nevertheless, evidence for inverse sequencing was also revealed through reports
25 of spontaneous self-talk following goal-directed self-talk, suggesting that goal-directed self-

1 talk might represent reason, although the voice of intuition might talk back.

2 One recent development in sport psychology is of special interest to organic self-talk
3 and the link between spontaneous and goal-directed self-talk. Whereas strategic self-talk
4 interventions, described in the following section, typically examine the effects of specific cue
5 words on performance-related variables (e.g., Theodorakis et al., 2000), some more recent
6 studies have examined the effects of reflexive interventions on improving athletes' organic
7 self-talk (e.g., Barwood, Corbett, Wagstaff, McVeigh, & Thelwell, 2015; Latinjak, Font-
8 Lladó, Zourbanos, & Hatzigeorgiadis, 2016). In these interventions, psychologically
9 challenging situations are explored, including experiences of the dynamic interplay of
10 spontaneous and goal-directed self-talk. Subsequently, past goal-directed self-talk is faced
11 with alternative approaches to regulating spontaneous self-talk, emotions, motivation and
12 behaviour. Interestingly, these innovative self-talk interventions in sport are based on
13 established cognitive-behavioural research and therapy, that has a long history of self-talk
14 used in psychological counselling. Along these lines, cognitive therapy emphasises the role of
15 organic self-talk in influencing an individual's subsequent feelings and behaviour. According
16 to Beck (1976), individuals are not always conscious of their spontaneous self-talk, yet, they
17 can learn to identify it, and, therefore, become able to examine any spontaneous, emotion-
18 filled thoughts and where useful, replace them with adaptive, goal-directed thinking (for a
19 specific example of self-talk use in cognitive-behavioural therapy see, for instance,
20 Gustafsson, Lundqvist, & Tod, 2017; Kendall & Treadwell, 2007).

21 Of note, the model presented by Van Raalte et al. (2016) and the framework outlined
22 by Latinjak et al. (2014) share important communalities, such as the distinction between
23 intuitive/spontaneous and rational/goal-directed thought processes. Thus, an integrative
24 conceptualization should reflect the two complimentary types of self-talk. Nonetheless, there
25 is also one relevant difference between both approaches. Van Raalte et al. distinguished

intuitive from rational self-talk, clustering strategic self-talk within the latter category. On the other hand, Latinjak et al. distinguished spontaneous from goal-directed self-talk within their conceptualization of organic self-talk; deeming strategic self-talk used in interventions outside their framework. Drawing from the strategic self-talk literature, it can be seen that both views are partly right, and that a combination of both perspectives is required to offer a contemporary conceptualization of self-talk.

Strategic self-talk

Whereas some studies explored athletes' self-talk via descriptive methods, the self-talk literature in sport has been dominated by studies exploring, through interventions, the effectiveness of self-talk strategies, due to its direct applied value (Galanis, Hatzigeorgiadis, Comoutos, Charachousi, & Sanchez, 2018). Hatzigeorgiadis, Zourbanos et al. (2014) first described strategic self-talk as the use of cue words aiming at facilitating learning and enhancing performance, through the activation of appropriate responses. These cues are typically used just prior to, or while, performing a task, and depending on the specific function cue words were targeting, they would be described as instructional or motivational. In early research, self-talk cues would be typically determined from the researcher, whereas later and following the recommendation of Hardy (2006) arguing for more self-determined forms of self-talk, researchers would in cases provide participants the chance to select among different cues, or to develop their own self-talk strategies. As evidenced in the meta-analysis (Hatzigeorgiadis et al., 2011) and the systematic review (Tod et al., 2011), strategic self-talk interventions have proven mostly effective. Moreover, it has been identified that for the development of effective self-talk plans various parameters, such as task characteristics (e.g. motor demands), contextual factors (e.g., performance setting), and individual differences (e.g., experience/learning stage) ought to be considered (Hatzigeorgiadis, Zourbanos, et al., 2014). Also based on the seminal work of Hardy (2006), more contemporary research has

attempted to explore the mechanisms explaining the facilitating effects of self-talk. This goes in line with the acknowledged need to link behaviour-change techniques, including self-talk, to theoretical mechanisms of action (Michie et al., 2016). Recent reviews of this part of the literature (Galanis, Hatzigeorgiadis, Zourbanos, & Theodorakis, 2016; Hatzigeorgiadis & Galanis, 2017) have forwarded attentional and motivational interpretations for the effectiveness of self-talk strategies in sport although there is emerging behaviourally oriented data that has been more recently published (e.g., Abdoli, Hardy, Riyahi, & Farsi, 2018).

Other, less commonly used strategic self-talk intervention conditions have been shaped by grammatical aspects of self-statements comparing, for example, individually referenced self-talk versus group-referenced self-talk (Son, Jackson, Grove, & Feltz, 2011), or declarative versus interrogative self-talk (e.g., Van Raalte et al., 2018). Even though findings on grammatical aspects of self-talk have been inconsistent, grammar is an aspect that could potentially enhance our understanding of self-talk, thus warranting further research attention via research on both self-talk entities.

Having described reflexive self-talk interventions in the previous section, it would be useful for the objectives of this review to outline how these are differentiated from the more traditional self-talk interventions targeting strategic self-talk, presented in this section. Three features distinguish strategic self-talk interventions focusing on the effectiveness of cue-words, from reflexive self-talk interventions focusing on improving goal-directed self-talk, described in the previous section. First, the content of strategic self-talk interventions is typically pre-determined, whereas in reflexive self-talk interventions it emerges from the situation and it is always self-determined. Second, the moment the self-instructions are verbalized in strategic self-talk interventions is typically fixed, before or during task execution; whereas in reflexive self-talk interventions participants must decide when to use the self-instruction during the task. Third, whereas in strategic self-talk interventions

1 verbalizing self-instructions is typically prescribed, in reflexive self-talk interventions it is
2 optional. Summarizing, strategic self-talk interventions are more mechanical as athletes are
3 trained to use specific cues to trigger respective responses and improve performance. In
4 reflexive self-talk interventions, athletes are encouraged to reflect on the content, timing and
5 use of their goal-directed self-talk and develop ideas for alternative self-talk plans to cope
6 with future challenges.

7 The distinction between strategic and reflexive self-talk interventions has important
8 implications for our understanding of self-talk. Initially, the research paradigms, evolving
9 around athletes' organic use of self-talk and strategic self-talk interventions, corresponded
10 with the research entities, that is, organic and strategic self-talk. However, since both
11 reflexive and strategic self-talk interventions have been described, this correspondence
12 between research paradigm and research objective, has partly been overcome. Not all
13 interventions in self-talk relate to strategic self-talk; some interventions relate to organic-
14 goal-directed self-talk (see Figure 1).

15 **Summing up**

16 Hardy's (2006) work has inspired a large body of research which has significantly
17 advanced our knowledge about self-talk. Nevertheless, knowledge has now advanced to a
18 point where Hardy's working definition needs updating to accommodate the contemporary
19 literature and serve as a conceptual framework for the study of self-talk in sports. Two
20 developments in particular within the self-talk research literature reinforce the need for a new
21 conceptualization of self-talk: (a) the identification of two distinct self-talk entities (organic
22 self-talk and strategic self-talk); and (b) the distinctions between spontaneous and goal-
23 directed self-talk, as these emerged within organic self-talk.

24 With regard to the most recent conceptualizations of self-talk, Zourbanos,
25 Hatzigeorgiadis, Kolovelonis, Latinjak and Theodorakis (2016) took into consideration the

distinction between self-talk entities, as they described self-talk as "...statements, phrases or cue-words that are addressed to the self which might be said automatically or very strategically ..." (p. 308). Nonetheless, the distinction between the spontaneous and goal-directed aspects of organic self-talk was not considered. Van Raalte et al. (2016) within their model identified intuitive and rational self-talk (corresponding to the spontaneous and goal-directed distinction), yet they do not discuss the two different self-talk entities apparent in the self-talk literature. Although we consider both conceptualizations to be important advances in the self-talk literature, we also believe that a new integrative, extended conceptualization accommodating the contemporary sport literature could provide an effective conceptual framework for the future study of self-talk in sports.

Hence, we come to the second stated purpose of the present review: the proposal of a new integrative conceptualization, reflective of past studies but adequately progressive to guide future research. Based on our literature review, we believe that for such a conceptualization to be sufficient so as to guide future research, several attributes of self-talk ought to be recognized: the necessary and sufficient attributes that define self-talk and descriptive attributes discussed above, including overtness, interpretation, origins and functions which explain characteristics of self-talk relevant to the literature.

Towards an integrative conceptualization of self-talk

Defining self-talk

Self-talk is relatively concrete, compared to more abstract concepts, such as beliefs, emotions or goals, which, according to Bagozzi (2007) would be considered of higher complexity. Considering that a definition should only include attributes that are necessary to describe the concept, and that these attributes together should be sufficient to distinguish it from other phenomena (Podsakoff et al., 2016), self-talk is a realist concept with two individually necessary attributes, which in combination are sufficient to describe its essence:

(a) self-talk takes form in verbalizations and (b) in self-talk, the sender of the message is also the receiver. Therefore, self-talk can be defined as verbalizations addressed to the self (Hardy, 2006). This definition turns self-talk into what Satori (1984) identified as a basic unit of thinking, distinguished from other units such as *thoughts*, which are not necessarily verbalizations, or *verbalizations*, which are not necessarily addressed to the self.

With regards to verbalizations, according to Van Raalte et al. (2016), “self-talk can be defined as an act of syntactically recognisable communication” (p. 140). However, others have suggested that self-talk could be more than words. For instance, Van Raalte et al. (1994) developed the Self-Talk and Gestures Rating Scale to assess observable verbalizations or self-talk. Our argument is in line with most previous conceptualizations of self-talk which restrict the concept of self-talk to *talking*, even though at some point an athlete might use a gesture to substitute a word. This decision is based on two reasons. First, language is much more complex in structure than gestures (McNeill & Pedelty, 1995) and, therefore, requires partially different activation patterns in the brain (Glenberg & Gallese, 2011). Second, gestures and facial expressions are also a fundamental component of emotional experiences and expression (e.g., Fontaine, Scherer, Roesch, & Ellsworth, 2007). Furthermore, since human emotions are inherently social (e.g., Friesen, Devonport, Sellars, & Lane, 2013), these gestures are a part of a social, rather than intrapersonal, interaction; while self-talk is, at its core, intrapersonal, not socially oriented.

The second necessary attribute, directly related to the prior argument, concerns to whom the self-talk is addressed to. Intuitively, this is the self (e.g., Hardy, 2006). However, athletes might use overt self-talk for its self-representational effects in sport and so self-talk could be directed at others (Van Raalte, 2010). We agree that self-talk can affect others. Moreover, we agree that self-talk, especially goal-directed self-talk, may have an interpersonal background. Statements such as “never give up” could be picked up by the

1 athlete from the media or their parents, even many years earlier. Yet, our position is that self-
2 talk in sport should be considered the conversation the athlete has with him/herself. If the
3 primary purpose of the talk is self-representational, then we would consider it not self-talk.

4 **Descriptive attributes of self-talk**

5 While the definition delimits self-talk as a basic unit of thinking, the conceptualization
6 of self-talk is broader as it includes decisions on what is important about the concept (Goertz,
7 2006). Aspects that have received significant research attention in the self-talk literature in
8 sport and have been considered as key elements of self-talk include: dimensions of overtness
9 (e.g., Hardy, 2006; Theodorakis et al., 2000; Van Raalte et al., 2016; Zourbanos et al., 2016),
10 functions (e.g., Hackfort and Schwenkmezger, 1993; Hardy, 2006; Zourbanos et al., 2016),
11 interpretative elements (e.g., Hardy, 2006), valence (Hardy, 2006), dynamic nature (Hardy,
12 2006) and origin (e.g., Zourbanos et al., 2016). Notwithstanding the importance of these
13 features, these should not be part of its definition, as they are not essential to what self-talk is.
14 Nevertheless, they are important attributes for the concept of self-talk, that is, its
15 conceptualization; as such, these are discussed below.

16 The first descriptive attribute is concerned with the articulation of self-talk. We
17 subscribe to Theodorakis et al.'s (2000) perspective that self-talk can be articulated either out
18 loud or as a small voice inside the head. Similarly, Hardy (2006) referred to a bipolar
19 overtness continuum with covert self-talk (that cannot be heard by another individual)
20 anchored at one end, and overt self-talk (said in a manner that allows another individual to
21 hear what was said) located at the other. In the sport literature, overtness has been mostly
22 discussed within strategic self-talk interventions. When cue words have to be repeated during
23 task execution, the decision about overtness can be crucial for intervention effectiveness, as
24 overt statements could establish socially available standards (Hayes et al., 1985). However,
25 with a lack of supporting evidence in sport, changes with regard to the overtness of self-talk

1 have also occurred. While in earlier studies participants were asked to verbalize aloud the
2 self-talk cues, in recent years, researchers, attempting to promote a more self-determined use
3 of self-talk, shifted to allowing participants to choose between overt and covert self-talk
4 based on participants' preferences (Hatzigeorgiadis, Zourbanos, et al., 2014).

5 Another attribute for the conceptualization of self-talk is its interpretation. Hardy
6 (2006) in his working definition underlined that self-talk has interpretative elements
7 associated to the content of the statements employed. While the issue of interpretation has
8 relevance to strategic self-talk, as it is intended to trigger some response, to date it has not
9 been extensively examined in the context of the content of organic self-talk (see Hardy, Hall,
10 & Alexander, 2001 for an exception). Van Raalte et al. (2014) did report that ratings made by
11 participants about their organic self-talk could be distinguished from those made by
12 researchers (see also, Latinjak et al., 2017). They recommended that researchers ought to
13 employ methods for coding organic self-talk that involve participant self-categorization,
14 arguing that the interpretative element of self-talk is only accessible by those who said the
15 statements. Consequently, we align with Hardy's initial position that the content of self-talk
16 has interpretative elements, which researchers should keep in mind when interpreting or
17 categorizing the content of self-talk.

18 One of the main attributes of this review, that has received considerable attention in
19 the recent literature, involves the origins of self-talk. A graphical representation of distinct
20 self-talk entities related to the origins of self-talk are presented in Figure 1. Research on the
21 two entities of self-talk, organic and strategic self-talk, is reflected in the different approaches
22 that have been used to study them (Theodorakis et al., 2012; Van Raalte, 2010). The former
23 describes self-talk as it occurs, whereas the latter enables insight into the effects of specific
24 strategies in sport psychology research and applied practice. Hence, to reflect the distinct
25 entities of self-talk (a cognitive process and predetermined verbalizations based on a strategic

plan) and to parsimoniously accommodate previous research in the new integrative conceptualization of self-talk, the distinction between organic and strategic self-talk ought to be acknowledged. The former is part of a string of research aimed to understand the psychology in sport, and the latter belongs to research on the use of psychology to improve sport performance.

Two important considerations ought to be kept in mind when distinguishing organic from strategic self-talk. First, the difference between both lies within their origins, and is, therefore, independent to the content of self-statements. A statement such as *calm down* can be either organic, when it is the result of an ongoing rational cognitive process deliberately employed to solve a problem in a specific situation (e.g., avoiding to talk back insultingly to the referee), or strategic, if the athlete follows a predetermined plan that consists of repeating cue words at specific moments to trigger an appropriate response (e.g., deep breathing). Second, statements developed through strategic self-talk interventions can become organic after the intervention. That is because athletes' metacognitive knowledge is built through different experiences, such as coach instructions, information picked up in the media or, less commonly, self-talk interventions (Efklides, 2014). If the athlete reflects on the cue words used in the strategic intervention, then these may become part of his/her metacognitive knowledge and be used organically some time after the intervention (Brick, MacIntyre, & Campbell, 2016). Hence, if the athlete internalizes a phrase, he/she learned during an intervention, and decides, autonomously, to use that statement to solve a problem at hand, then this self-talk is clearly organic.

Concerning research, these considerations ought to be kept in mind to avoid misinterpreting strategic self-talk as goal-directed self-talk in studies in organic self-talk. For example, in a study inquiring into athletes' self-talk following a competition, a response such as *move on* could be classified by the researcher as organic, when this may have been part of

1 a predetermined strategic self-talk plan. To avoid misinterpretation in such instances, the
2 design, either quantitative or qualitative, should allow the participants to identify the type of
3 reported self-talk. This is currently not the case, and, hence, in studies on organic self-talk,
4 such as Latinjak et al. (2017), there is doubt if reported self-talk was strategic rather than
5 organic as interpreted by the researchers. On the contrary, in studies on strategic self-talk
6 interventions, the use of organic self-talk alongside the predetermined cue words has been
7 introduced and is habitually explored through control questions (e.g., Hatzigeorgiadis,
8 Galanis, Zourbanos, & Theodorakis, 2014).

9 Furthermore, fine tuning on the origins of organic self-talk, following theoretical
10 approaches from general psychology (Christoff, 2012; Kahneman, 2011), a new integrative
11 conceptualization needs to distinguish spontaneous from goal-directed self-talk (Figure 1).
12 This distinction helps us to decide whether it is more important to inquire into the content
13 (what) or the functions (purpose or sought outcomes) of self-talk. Spontaneous self-talk is
14 formulated without intention and could be considered a window into psychological states
15 such as emotions, performance beliefs or attributions, as it helps bring current experiences
16 into awareness (Van Raalte et al., 2016). The implication for future research is that it is
17 likely that content is more relevant to consider than functions when examining spontaneous
18 self-talk. In contrast, goal-directed self-talk aims at solving problems and making progress on
19 a task; consequently, it is the ends to which statements are formulated (i.e., functions) that is
20 more interesting to researchers and practitioners. To illustrate, Latinjak et al. (2018) found
21 evidence of athletes using negative reinforcement self-talk (“That was crap”) purposefully to
22 improve their performance. It was argued that the valence (a classification based on content)
23 of such goal-directed statements may be relatively irrelevant compared to the functions
24 through which the statement helps the athlete to identify unfavorable situations in the
25 environment and engage in preventative or problem-solving related action.

Following the discussion in the paragraph above, a last descriptive attribute involves what has received considerable attention in the literature: the functions of self-talk. Mainly, these were grouped into instructional and motivational in previous conceptualizations (e.g., Hardy, 2006; Zourbanos et al., 2016), with some noticeable exceptions (see Table S1: Hackfort & Schwenkmezger, 1993). In our conceptualization, we still consider this classification relevant for strategic self-talk. However, to date, we would refrain from classifying organic self-talk with regard to its functions. Based on the developing literature (e.g., Latinjak et al., 2018; Van Raalte et al., 2015) the distinction between instructional and motivational functions seems over-simplistic. Self-talk appears to serve a number of cognitive, emotional, and behavioural functions, which still require further attention by research.

An integrative conceptualization of self-talk

Considering all previous arguments, and to help guide and organize future research, it is timely to offer a new integrative conceptualization of self-talk for sport research. Taking into account the necessary and sufficient, and descriptive attributes of self-talk, we believe that self-talk should be described as follows: Self-talk takes form in verbalizations addressed to the self, overtly or covertly, characterized by interpretative elements associated to their content; and it either (a) reflects dynamic interplays between organic, spontaneous and goal-directed, cognitive processes or (b) conveys messages to activate responses through the use of predetermined cues developed strategically, to achieve performance related outcomes.

Considering this conceptualization and compared with Hardy's (2006) initial definition of self-talk, certain similarities and deviations exist. First, parts of Hardy's definition refer to who the self-talk is addressed to and the interpretative element associated to the content of the statements; these remain an explicit part of our current conceptualization. Second, Hardy's ideas of a multidimensional nature are reflected in our

wider conceptualization, describing aspects of origin, overtness, and interpretation, but not valence. The profile of valence as a descriptive element of self-talk has lessened during the past decade. Following the advances in self-talk research, the valence should be considered an important element of spontaneous self-talk, but not of goal-directed or strategic self-talk, where the function (i.e., the outcome sought through self-talk) is of primary importance. Hardy also underlined the dynamic nature of self-talk and similarly we have stressed the interplay between the intuitive spontaneous self-talk and reactive goal-directed self-talk.

Implications for future research

The purpose of this review was to present a new conceptualization of self-talk, reflective of past studies but adequately progressive to guide future research. In doing so, we anticipated that we would stimulate new research questions, ultimately further developing the topic and enriching understanding. At this point, we would like to outline two ways in which the integrative conceptualization could meet these expectancies. Firstly, a comprehensive conceptualization would help researchers to identify and communicate through a *common language* what type of self-talk or self-talk intervention they focus on. This could help adopting appropriate research designs and methods, but also improve the recognisability of relevant research. To date, some research on self-talk is less known to researchers in the area of self-talk because the authors used different terms to label their variables (as it is the case, for example, for the studies by, Calmeiro, Tenenbaum, & Eccles, 2010, and, Garcia, Razon, Hristovski, Balaguer, & Tenenbaum, 2015).

Secondly, our description of the different conceptualizations of self-talk should eventually stimulate new research ideas. These research ideas can be grouped around the specific subtypes of self-talk (e.g., studies on spontaneous self-talk), or across self-talk types (e.g., studies on organic self-talk and strategic self-talk). First, a distinct research agenda can be identified for each area of self-talk research. On the one hand, future research should

1 inquire into variations in spontaneous self-talk as a function of individual differences, such as
2 personality or cultural background; contextual variables, such as motivational climate or
3 coaching behaviours, to understand coaches' role in spontaneous cognitive reactions;
4 situational variables such as competitive circumstances and anxiety; and importantly the
5 reciprocal relationship between spontaneous self-talk and performance. Research on goal-
6 directed self-talk, on the other hand, might benefit from studying variations in self-talk
7 functions as a result of personal variables (e.g., level of expertise), contextual variables (e.g.,
8 the presence or absence of social support) and situational variables (e.g., levels of self-
9 efficacy). Future research is also warranted to offer guidelines on how to conduct reflexive
10 self-talk interventions in different contexts and to provide evidence on the short- and long-
11 term effects of such interventions. In addition, a research agenda can be developed to explore
12 the dynamic interplay between spontaneous and goal-directed self-talk, to enhance our
13 understanding of the conversations within the athlete's mind. Finally, towards the integration
14 of organic and strategic self-talk, research could also examine the effects of strategic self-talk
15 interventions on organic, goal-directed, and spontaneous self-talk.

16 Regarding future research on self-talk interventions, all types of interventions can aid
17 our understanding of the effectiveness of self-talk strategies; nevertheless, some may be more
18 appropriate to address research questions in particular contexts. Strategic interventions are
19 simpler, more fixed, and replicable; thus, they are best suited for more controlled settings and
20 oriented towards basic research approaches. Less strictly defined interventions such as those
21 proposed by the IMPACT-ST approach for developing self-talk interventions
22 (Hatzigeorgiadis, Zourbanos, et al., 2014) allow for the involvement of the individuals, thus
23 increasing to a degree self-determination; however, they also lead to strategic self-talk plans
24 to be used at particular instances. Such interventions can be implemented in field to deal with
25 fixed and specific performance issues. Finally, flexible and self-determined interventions,

1 such as reflexive self-talk interventions (Latinjak et al., 2016), are more malleable and less
2 controlled, and are related to the improvement of metacognitive skills. These interventions
3 aim to improve the athlete's understanding of his/her self-talk and to stimulate the planning
4 of and reflection about the use of cognitive strategies in sport.

5 **Final remarks**

6 To conclude, we adhere to Hardy's (2006) reflexion about changes in socially
7 constructed variables. As our understanding of self-talk develops, it is extremely likely that
8 the previous postulates will need to be reviewed, edited or replaced, just as was apparent with
9 Hardy's position. It is because the complexity of our own existence exceeds our capability for
10 understanding that we need concepts such as thought, emotion or self-talk. Such concepts
11 help us to establish comprehensible domains in the tangled network of daily experiences.
12 Furthermore, to aid clarity, the meaning of these concepts ought to be shared which requires
13 efforts to define and describe them, as in the current manuscript. Given that science is a social
14 endeavour in which one's ideas build upon others' previous work, the creation of
15 theoretically sound frameworks that guide future research are of great worth as they facilitate
16 correspondence between different studies about the same phenomenon. This is as true for
17 self-talk as for any other construct, and, hence, we believe that the integrative
18 conceptualization offered herein will help to understand and integrate past research, and to
19 guide and stimulate future investigations around self-talk.

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References

- Abdoli, B., Hardy, J., Riyahi, J.F., & Farsi, A. (2018). A closer look at how self-talk influences skilled basketball performance. *The Sport Psychologist*, 32, 9–15.
<http://doi:10.1123/tsp.2016-0162>
- Bagozzi, R. P. (2007). On the meaning of formative measurement and how it differs from reflective measurement: Comment on Howell, Breivik, and Wilcox (2007). *Psychological Methods*, 12, 229-237. <http://dx.doi.org/10.1037/1082-989X.12.2.229>
- Barwood, M. J., Corbett, J., Wagstaff, C. R., McVeigh, D., & Thelwell, R. C. (2015). Improvement of 10-km time-trial cycling with motivational self-talk compared with neutral self-talk. *International Journal of Sports Physiology and Performance*, 10(2), 166–171. <https://doi.org/10.1123/ijsp.2014-0059>
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: New American Library.
- Brick, N. E., MacIntyre, T. E., & Campbell, M. J. (2016). Thinking and action: a cognitive perspective on self-regulation during endurance performance. *Frontiers in Physiology*, 7, 159. <https://doi.org/10.3389/fphys.2016.00159>
- Brinthaup, T. M., Hein, M. B., & Kramer, T. E. (2009). The self talk scale: Development, factor, analysis, and validation. *Journal of Personality Assessment*, 91, 82-92.
<https://doi.org/10.1080/00223890802484498>
- Calmeiro, L., Tenenbaum, G., & Eccles, D. (2010). Event-sequence analysis of appraisals and coping during trapshooting performance. *Journal of Applied Sport Psychology*, 22(4), 392-407. <https://doi.org/10.1080/10413200.2010.495325>
- Christoff, K. (2012). Undirected thoughts: Neural determinants and correlates. *Brain Research*, 1428, 51-59. <https://doi.org/10.1016/j.brainres.2011.09.060>
- Christoff, K. (2013). Thinking. In K. Ochsner & S. M. Kosslyn (Eds.), *The oxford handbook*

1 *of cognitive neuroscience. The cutting edges 2* (pp. 318-333). Oxford, UK: Oxford
 2 University Press.

3 Christoff, K., Gordon, A., & Smith, R. (2011). The role of spontaneous thought in human
 4 cognition. In O. Vartanian & R. Mandel (Eds.), *Neuroscience of decision making* (pp.
 5 259-284). New York, NY: Psychological Press.

6 Conroy, D. E., & Metzler, J. N. (2004). Patterns of self-talk associated with different forms of
 7 competitive anxiety. *Journal of Sport and Exercise Psychology*, 26, 69-89.
 8 <https://doi.org/10.1123/jsep.26.1.69>

9 Efklides, A. (2014). How does metacognition contribute to the regulation of learning? An
 10 integrative approach. *Psihologijske Teme*, 23, 1-30.

11 Fontaine, J. R. J., Scherer, K. R., Roesch, E. B., & Ellsworth, P. C. (2007). The world of
 12 emotion is not two-dimensional. *Psychological Science*, 18, 1050-1057.
 13 <https://doi.org/10.1111/j.1467-9280.2007.02024.x>

14 Friesen, A. P., Devonport, T. J., Sellars, C. N., & Lane, A. M (2013). A narrative account of
 15 decision-making and interpersonal emotion regulation using a social-functional
 16 approach to emotions. *International Journal of Sport and Exercise Psychology*, 11,
 17 203-214. <https://doi.org/10.1080/1612197X.2013.773664>

18 Galanis, E., Hatzigeorgiadis, A., Comoutos, A., Charachousi, F., & Sanchez, X. (2018). From
 19 the lab to field: Effects of self-talk on task performance under distracting conditions.
 20 *The Sport Psychologist*, 32, 26-32. doi:10.1123/tsp.2017-0017

21 Galanis, E., Hatzigeorgiadis, A., Zourbanos, N., & Theodorakis, Y. (2016). Why self-talk is
 22 effective? Perspectives on self-talk mechanisms in sport. In M. Raab, P. Wylleman, R.
 23 Seiler, A.-M. Elbe & A. Hatzigeorgiadis (Eds), *Sport and exercise psychology*
 24 *research: From theory to practice*. Elsevier: London, UK.

25 Garcia, S., Razon, S., Hristovski, R., Balaguer, N., & Tenenbaum, G. (2015). Dynamic

- 1 stability of task-related thoughts in trained runners. *The Sport Psychologist*, 29, 302 -
2 309. <https://doi.org/10.1123/tsp.2014-0094>
- 3 Glenberg, A. M., & Gallese, V. (2011). Action-based language: A theory of language
4 acquisition, comprehension, and production. *Cortex*, 48, 905-922.
5 <https://doi.org/10.1016/j.cortex.2011.04.010>
- 6 Goertz, G. (2006). *Social science concepts: A user's guide*. Princeton, NJ: Princeton
7 University Press
- 8 Gustafsson, H., Lundqvist, C., & Tod, D. (2017). Cognitive behavioral intervention in sport
9 psychology: A case illustration of the exposure method with an elite athlete. *Journal*
10 *of Sport Psychology in Action*, 8, 152-162.
11 <https://doi.org/10.1080/21520704.2016.1235649>
- 12 Hackfort, D., & Schwenkmezger, P. (1993). Anxiety. In R.N. Singer, M. Murphey, & L.K.
13 Tennant, (Eds.). *Handbook of research on sport psychology* (pp. 328–364). New
14 York: Macmillan.
- 15 Hardy, J. (2006). Speaking clearly: A critical review of the self-talk literature. *Psychology of*
16 *Sport and Exercise*, 7, 81-97. <https://doi.org/10.1016/j.psychsport.2005.04.002>
- 17 Hardy, J., Comoutos, N., & Hatzigeorgiadis, A. (2018). Reflections on the maturing research
18 literature of self-talk in sport: Contextualizing the special issue. *The Sport*
19 *Psychologist*, 32, 1–8. <https://doi.org/10.1123/tsp.2017-0141>
- 20 Hardy, J., Gammage, K., & Hall, C. R. (2001). A description of athlete's self-talk. *The Sport*
21 *Psychologist*, 15, 306–318. <https://doi.org/10.1123/tsp.15.3.306>
- 22 Hardy, J., Hall, C. R., & Alexander, M. R., (2001). Exploring self-talk and affective states in
23 sport. *Journal of Sports Sciences*, 19, 469–475.
24 <https://doi.org/10.1080/026404101750238926>
- 25 Hardy, J., Hall, C. R., & Hardy, L. (2005). Quantifying self-talk. *Journal of Sports Sciences*,

- 23, 905–917. <https://doi.org/10.1080/02640410500130706>
- Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers*. Chichester, UK: Jones Wiley & Sons.
- Hatzigeorgiadis, A., & Galanis, E. (2017). Self-talk effectiveness and attention. *Current Opinion in Psychology*, 16, 138-142. <https://doi.org/10.1016/j.copsyc.2017.05.014>
- Hatzigeorgiadis, A., Galanis, V., Zourbanos, N., & Theodorakis, Y. (2014). Self-talk and competitive sport performance. *Journal of Applied Sport Psychology*, 26, 82-95. <https://doi.org/10.1080/10413200.2013.790095>
- Hatzigeorgiadis, A., Zourbanos, N., Galanis, E., & Theodorakis, Y. (2011). Self-talk and sport performance: A meta-analysis. *Perspectives on Psychological Science*, 6, 348-356. <https://doi.org/10.1177/1745691611413136>
- Hatzigeorgiadis, A., Zourbanos, N., Latinjak, A. T., & Theodorakis, Y. (2014). Self-talk. In A. Papaioannou and D. Hackfort (Eds.), *Routledge companion to sport and exercise psychology* (pp. 372-386). New York, NY: Routledge
- Hayes, S. C., Rosenfarb, I., Wulfert, E., Munt, E. D., Korn, Z., & Zettle, R. D. (1985). Self-reinforcement: An artifact of social standard setting? *Journal of Applied Behavior Analysis*, 18, 201–214. <https://doi.org/10.1901/jaba.1985.18-201>
- Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar, Straus, and Giroux.
- Kendall, P. C., & Treadwell, K. R. (2007). The role of self-statements as a mediator in treatment for youth with anxiety disorders. *Journal of Consulting and Clinical Psychology*, 75(3), 380-389. DOI: 10.1037/0022-006X.75.3.380
- Klinger, E. (1977). *Meaning & void: Inner experience and the incentives in people's lives*. Minneapolis, MN: University of Minnesota Press.
- Latinjak, A. T. (2018). Goal-directed, spontaneous and stimulus-independent thoughts and mindwandering in a competitive context. *The Sport Psychologist*, 32, 51-59.

<https://doi.org/10.1123/tsp.2016-0044>

Latinjak, A. T., Corbalan-Frigola, J., Alcoy-Fabregas, P., & Barker, J. B. (*accepted for publication*). Spontaneous self-talk: An insight into the cognitive component of emotions in sport. *International Journal of Sport Psychology*.

Latinjak, A. T., Font-Lladó, R., Zourbanos, N., & Hatzigeorgiadis, A. (2016). Goal-directed self-talk interventions: A single-case study with an elite athlete. *The Sport Psychologist*, 30, 189-194. <https://doi.org/10.1123/tsp.2015-0120>

Latinjak, A. T., Hatzigeorgiadis, A., & Zourbanos, N. (2017). Goal-directed and spontaneous self-Talk in anger-and anxiety-eliciting sport-situations. *Journal of Applied Sport Psychology*, 29, 150-166. <https://doi.org/10.1080/10413200.2016.1213330>

Latinjak, A. T., Masó, M., & Comoutos, N. (2018). Goal-directed self-talk used during technical skill acquisition: The case of novice ultimate frisbee players. *The Sport Psychologist*, 32, 60-65. <https://doi.org/10.1123/tsp.2017-0047>

Latinjak, A. T., Zourbanos, N., López-Ros, V., & Hatzigeorgiadis, A. (2014). Goal-directed and undirected self-talk: Exploring a new perspective for the study of athletes' self-talk. *Psychology of Sport and Exercise*, 15, 548-558.

<https://doi.org/10.1016/j.psychsport.2014.05.007>

Lieberman, M. D. (2003). Reflective and reflexive judgment processes: A social cognitive neuroscience approach. In J. P. Forgas, K. D. Williams, and W. von Hippel (Eds.), *Social judgments. Implicit and explicit processes*, (pp. 44–67). Cambridge, UK: Cambridge University Press.

McNeill, D., & Pedelty, L. (1995). Right brain and gesture. In K. Emmorey and J. Reilly (Eds), *Language, Gesture and Space* (pp. 63–86). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Michie, S., Carey, R. N., Johnston, M., Rothman, A. J., Bruin, M. D., Kelly, M. P., &

- 1 Connell, L. E. (2016). From theory-inspired to theory-based interventions: A protocol
2 for developing and testing a methodology for linking behaviour change techniques to
3 theoretical mechanisms of action. *Annals of Behavioral Medicine*, 52, 501-512.
4 <https://doi.org/10.1007/s12160-016-9816-6>
- 5 Oliver, E. J., Markland, D., Hardy, J., Petherick, C. M. (2008). The effects of autonomy-
6 supportive and controlling environments on self-talk. *Motivation and Emotion*, 32,
7 200–212. <https://doi.org/10.1007/s11031-008-9097-x>
- 8 Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2016). Recommendations for
9 creating better concept definitions in the organizational, behavioral, and social
10 sciences. *Organizational Research Methods*, 19(2), 159-203.
11 <https://doi.org/10.1177/1094428115624965>
- 12 Sartori, G. (1984). Guidelines for concept analysis. In G. Sartori (Ed.), *Social science*
13 *concepts: A systematic analysis* (pp. 15-85). Beverly Hills, CA: Sage Publications.
- 14 Son, V., Jackson, B., Grove, J. R., & Feltz, D. L. (2011). “I am” versus “we are”: Effects of
15 distinctive variants of self-talk on efficacy beliefs and motor performance. *Journal of*
16 *Sports Sciences*, 13, 1417-1424. <https://doi.org/10.1080/02640414.2011.593186>
- 17 Theodorakis, Y., Hatzigeorgiadis, A., & Chroni, S. (2008). Self-talk: It works, but how?
18 Development and preliminary validation of the functions of Self talk Questionnaire.
19 *Measurement in Physical Education and Exercise Science*, 12, 10-30.
20 <https://doi.org/10.1080/10913670701715158>
- 21 Theodorakis, Y., Hatzigeorgiadis, A., & Zourbanos, N. (2012). Cognitions: Self-talk and
22 performance. In S. Murphy (Ed.), *The oxford handbook of sport and performance*
23 *psychology*. New York, NY: Oxford University Press.
- 24 Theodorakis, Y., Weinberg, R., Natsis, P., Douma, E., & Kazakas, P. (2000). The effects of
25 motivational versus instructional self-talk on improving motor performance. *The*

- 1 *Sport Psychologist*, 14, 253-272. <https://doi.org/10.1123/tsp.14.3.253>
- 2 Tod, D., Hardy, J., & Oliver, E. J. (2011). Effects of self-talk: A systematic review. *Journal*
3 *of Sport and Exercise Psychology*, 33, 666-687. <https://doi.org/10.1123/jsep.33.5.666>
- 4 Unterrainer, J. M., & Owen, A. M. (2006). Planning and problem solving: From
5 neuropsychology to functional neuroimaging. *Journal of Physiology, Paris*, 99(4-6),
6 308-317. <https://doi.org/10.1016/j.jphysparis.2006.03.014>
- 7 Van Raalte, J. (2010). Self-talk. In S. J. Hanrahan, and M. B. Andersen, (Eds.) *Routledge*
8 *handbook of applied sport psychology* (pp. 510-517). New York, NY: Routledge.
- 9 Van Raalte, J. L., Brewer, B. W., Rivera, P. M., & Petitpas, A. J. (1994). The relationship
10 between observable self-talk and competitive junior tennis players' match
11 performances. *Journal of Sport and Exercise Psychology*, 16(4), 400-415.
12 <https://doi.org/10.1123/jsep.16.4.400>
- 13 Van Raalte, J. L., Cornelius, A. E., Copeskey, M., Brewer, B. W. (2014). Say what? An
14 analysis of spontaneous self-talk categorization. *The Sport Psychologist*, 28, 390-393.
15 <https://doi.org/10.1123/tsp.2014-0017>
- 16 Van Raalte, J., Cornelius, A., Mullin, E., Brewer, B. W., Van Dyke, E., Johnson, A. J., &
17 Iwatsuki, T. (2018). I will use declarative self-talk... or will I? Replication, extension,
18 and meta-analyses. *The Sport Psychologist*, 32, 16-25.
19 <https://doi.org/10.1123/tsp.2016-0088>
- 20 Van Raalte, J., Morrey, R. B., Cornelius, A., & Brewer, B. W. (2015). Self-talk of marathon
21 runners. *The Sport Psychologist*, 29, 258-260. <https://doi.org/10.1123/tsp.2014-0159>
- 22 Van Raalte, J. L., Vincent, A., & Brewer, B. W. (2016). Self-talk: Review and sport-specific
23 model. *Psychology of Sport and Exercise*, 22, 139-148.
24 <https://doi.org/10.1016/j.psychsport.2015.08.004>
- 25 Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: MIT Press.

Weinberg, R. S. (1988). *The mental advantage: Developing your psychological skills in tennis*. Champaign, IL: Human Kinetics.

Weinberg, R. S., Smith, J., Jackson, A., & Gould, D. (1984). Effect of association, dissociation and positive self-talk strategies on endurance performance. *Canadian Journal of Applied Sport Sciences*, 9, 25-32.

Winsler, A. (2009). Still talking to ourselves after all these years: A review of current research on private speech. In A. Winsler, C. Fernyhough, & I. Montero (Eds.), *Private speech, executive functioning, and the development of verbal self-regulation* (pp. 3-41). New York: Cambridge University Press.

Zell, E., Warriner, A. B., & Albarracin, D. (2012). Splitting of the mind: When the you I talk to is me and needs commands. *Social Psychology and Personality Science*, 3, 549-555. <https://doi.org/10.1177/1948550611430164>

Zourbanos, N., Hatzigeorgiadis, A., Chroni, S., Theodorakis, Y., & Papaianou, A (2009). Automatic self-talk questionnaire for sports (ASTQS): Development and preliminary validation of a measure identifying the structure of athletes' self-talk. *The Sport Psychologist*, 23, 233-251. <https://doi.org/10.1123/tsp.23.2.233>

Zourbanos, N., Hatzigeorgiadis, A., Kolovelonis, A., Latinjak, A. T., & Theodorakis, Y. (2016). The use of self-talk in the organization of a lesson in sport, physical education and exercise settings. In P. A. Davis (Ed.), *The Psychology of Effective Coaching and Management* (pp. 307-320). New York: Nova Science Publishers, Inc.

1 *Figure 1.* Outline of the main self-talk entities, and their main subtypes, in sport self-talk
 2 literature

